CLAIMS

1. A pneumatic tire comprising:

a pair of right and left bead portions,

a carcass layer disposed extending between the bead portions,

a tread portion disposed at an outside of the carcass layer in a radial direction of the tire,

a pair of side wall portions disposed at right and left sides of the tread portion and

at least one of a rubber member constituted with a rigid rubber and disposed in the bead portions and a rubber member disposed in the side wall portions,

wherein at least one of the rubber member disposed in the bead portions and the rubber member disposed in the side wall portions is constituted with a rubber composition (r1) having a minimum value of a dynamic storage modulus within a temperature range of 200 to 250°C which is 75% or more of a dynamic storage modulus at 50°C.

2. A pneumatic tire according to Claim 1, wherein the rubber composition (r1) has a dynamic storage modulus in a range of 2 to 20 MPa at 50°C

3. A pneumatic tire comprising:

a pair of right and left bead portions,

a carcass layer disposed extending between the bead portions,

a tread portion disposed at an outside of the carcass layer in a radial direction of the tire,

a pair of side wall portions disposed at right and left sides of the tread portion

and

at least one of a rubber member constituted with a rigid rubber and disposed in the bead portions and a rubber member disposed in the side wall portions,

wherein at least one of the rubber member disposed in the bead portions and the rubber member disposed in the side wall portions is constituted with a rubber composition (r2) which comprises a rubber component (A) comprising 40% by weight or more of (1) a conjugated diene based elastic polymer having a content of a vinyl linkage of 25% or more in conjugated diene units or (2) a conjugated diene based elastic polymer (a) having at least one of a nitrogen atom and a silicon atom in its molecule.

4. A pneumatic tire according to Claim 3, wherein the conjugated diene based elastic polymer (a) has a weight-average molecular weight (Mw) in a range of 200,000 to 900,000.

5. A pneumatic tire according to any one of Claims 3 and 4, wherein the conjugated diene based elastic polymer (a) has a molecular weight distribution (Mw/Mn), which is expressed as a ratio of a weight-average molecular weight to a number-average molecular weight (Mn), in a range of 1 to 4.

6. A pneumatic tire according to any one of Claims 3 to 5, wherein the conjugated diene based elastic polymer (a) is at least one polymer selected from a group consisting of a homopolymer of a conjugated diene monomer, a copolymer of conjugated diene monomers and a copolymer of a conjugated diene monomer and an aromatic vinyl monomer

7 A pneumatic tire according to Claim 6, wherein the conjugated diene based elastic polymer (a) is at least one polymer selected from a group consisting of polybutadiene, styrene-butadiene copolymers, modified polybutadiene and modified styrene-butadiene copolymers.

8 A pneumatic tire according to any one of Claims 3 to 7, wherein the rubber component (A) comprises 40% by weight or more of the conjugated diene based elastic polymer (a) having a content of a vinyl linkage of 25% or more in conjugated diene units and 40% or more of the polymer having at least one of a tin atom, a nitrogen atom and a silicon atom in its molecule.

9. A pneumatic tire according to Claim 8, wherein 40% by weight or more of the conjugated diene based elastic polymer (a) comprises at least one of a tin atom, a nitrogen atom and a silicon atom in its molecule.

10. A pneumatic tire according to any one of Claims 8 and 9, wherein the conjugated diene based elastic polymer (a) is obtained by reaction with a compound having a tin atom in its molecule after polymerization .

11. A pneumatic tire according to Claim 10, wherein the compound having a tin atom in its molecule is at least one compound selected from a group consisting of tin tetrachloride, tributyltin chloride, dioctyltin dichloride, dibutyltin dichloride and triphenyltin chloride

12 A pneumatic tire according to any one of Claims 8 and 9, wherein the conjugated diene based elastic polymer (a) is obtained by reaction with a compound

having a nitrogen atom in its molecule after a completion of polymerization.

13. A pneumatic tire according to Claim 12, wherein the compound having a nitrogen atom in its molecule is at least one compound selected from a group consisting of isocyanate compounds, aminobenzophenone compounds, urea derivatives, 4-dimethylamino-benzylideneaniline, dimethylimidazolidinone and N-methylpyrrolidone

14. A pneumatic tire according to Claim 13, wherein the isocyanate compound is at least one compound selected from a group consisting of 2,4-tolylene diisocyanate and diisocyanatodiphenylmethane.

15. A pneumatic tire according to Claim 13, wherein the aminobenzophenone compound is at least one compound selected from a group consisting of 4,4'-bis(diethylamino)benzophenone and 4-(dimethylamino)benzophenone.

16 A pneumatic tire according to Claim 13, wherein the urea derivative is at least one compound selected from a group consisting of 1,3-dimethyl-2-imidazolidinone, 1,3-diethyl-2-imidazolidinone and 1,3-dimethyl-3,4,5,6-tetrahydropyrimidine.

17. A pneumatic tire according to any one of Claims 8 and 9, wherein the conjugated diene based elastic polymer (a) is obtained by reaction with a compound having a silicon atom in its molecule after a completion of polymerization.

18. A pneumatic tire according to Claim 17, wherein the compound having a silicon atom in its molecule is at least one compound selected from a group consisting of

alkoxysilanes and aminoalkoxysilanes.

19. A pneumatic tire according to Claim 18, wherein the alkoxysilane is at least one compound selected from a group consisting of methylethoxysilane, tetraethoxysilane, 3-glycidoxypropyltriethoxysilane and 3-glycidoxypropyltrimethoxysilane.

20. A pneumatic tire according to Claim 18, wherein the aminoalkoxysilane is at least one compound selected from a group consisting of 1-{3-(triethoxysilyl)propyl}-4,5-dihydroimidazole, N-(1,3-dimethylbutylidene)-3-(triethoxysilyl)-1-propaneamine, dimethylamino-propyltriethoxysilane, N-(1-methylpropylidene)-3-(triethoxysilyl)-1-propaneamine and N-(1,3-dimethylbutylidene)-3-(triethoxysilyl)-1-propaneamine.

21. A pneumatic tire according to any one of Claims 3 to 20, wherein the rubber component (A) comprises a conjugated diene based polymer having a branched structure.

22. A pneumatic tire comprising·

a pair of right and left bead portions,

a carcass layer disposed extending between the bead portions,

a tread portion disposed at an outside of the carcass layer in the radial direction of the tire,

a pair of side wall portions disposed at right and left sides of the tread portion and

at least a rubber member constituted with a rigid rubber and disposed in the

bead portions and a rubber member disposed in the side wall portions,

wherein at least one of the rubber member disposed in the bead portions and the rubber member disposed in the side wall portions is constituted with a rubber composition (r3) comprising compound (B) which is at least one compound selected from a group consisting of a citraconimide compound, an acrylate compound and a compound represented by following general formula (I):

$$R^1\text{-S-S-A-S-S-}R^2 \qquad (I)$$

wherein A represents an alkylene group having 2 to 10 carbon atoms and R^1 and R^2 each independently represents a monovalent organic group having a nitrogen atom.

23. A pneumatic tire according to Claim 22, wherein the citraconimide compound of the (B) component is biscitraconimide

24. A pneumatic tire according to Claim 23, wherein the biscitraconimide compound of the (B) component is 1,6-bis(citraconimidomethyl)benzene.

25. A pneumatic tire according to Claim 22, wherein the acrylate compound of the (B) component is a polyvalent ester obtained from a polyhydric alcohol and an acrylic acid and a polyvalent ester obtained from a polyhydric alcohol and an acrylic acid and another carboxylic acid.

26. A pneumatic tire according to Claim 25, wherein the acrylate compound is dipentaerythritol acrylate modified with acyl group.

27. A pneumatic tire according to Claim 22, wherein, in the general formula (I) of the (B) component, A represents hexamethylene group.

28. A pneumatic tire according to Claim 27, wherein the compound represented by the general formula (I) of the (B) component is 1,6-bis(N,N'-dibenzylthiocarbamoyldithio)hexane.

29 A pneumatic tire according to any one of Claims 22 to 28, the rubber composition (r3) further comprises a rubber component (A), wherein the (B) component is comprised in an amount of 0.5 to 20 parts by weight per 100 parts by weight of the rubber component (A).

30. A pneumatic tire according to any one of Claims 3, 5 and 22, wherein the rubber compositions (r1), (r2) and (r3) further comprises a reinforcing filler (C) comprising at least one filler selected from a group consisting of reinforcing inorganic fillers and a carbon black.

31. A pneumatic tire according to Claim 30, wherein the reinforcing inorganic filler is porous.

32. A pneumatic tire according to Claim 31, wherein the reinforcing inorganic filler is at least one filler selected from a group consisting of silica and compounds represented by a following general formula:

$$mM^1 \cdot xSiO_y \cdot zH_2O$$

wherein M^1 represents at least one of a metal selected from Al, Mg, Ti and Ca, an oxide of said metal and a hydroxide of said metal, **m** represents an integer of 1 to 5, **x** represents an integer of 0 to 10, **y** represents an integer of 2 to 5 and **z** represents an integer of 0 to 10

33. A pneumatic tire according to Claim 31, wherein the reinforcing inorganic filler has a nitrogen adsorption specific surface area measured by the BET method in the range of 50 to 400 m^2/g.

34. A pneumatic tire according to Claim 31, wherein the reinforcing inorganic filler is at least one filler selected from a group consisting of silica, aluminum hydroxide, aluminum oxide, calcium carbonate, magnesium carbonate, clay and zeolite

35. A pneumatic tire according to Claim 30, wherein the carbon black has a nitrogen adsorption specific surface area measured by the BET method in the range of 50 to 400 m^2/g

36. A pneumatic tire according to any one of Claims 3 to 35, wherein the rubber compositions (r1), (r2) and (r3) further comprises sodium 1,6-hexamethylenedithiosulfate dihydrate.

37. A pneumatic tire according to any one of Claims 3 to 36, wherein the rubber members disposed in the side wall portions are each arranged in the side wall portion at an inner side of the tire and adjacent to the carcass layer.

38. A pneumatic tire comprising:

a pair of right and left bead portions,

a carcass layer disposed extending between the bead portions,

a tread portion disposed at an outside of the carcass layer in a radial direction of the tire,

a pair of side wall portions disposed at right and left sides of the tread portion and

at least one of a rubber member constituted with a rigid rubber and disposed in the bead portions and a rubber member disposed in the side wall portions,

wherein at least one of the rubber member disposed in the bead portions and the rubber member disposed in the side wall portions is constituted with at least one of a rubber composition selected from a group consisting of the rubber composition (r1), the rubber composition (r2) and the rubber composition (r3) and a rubber-filament fiber composite is disposed in the side wall portion.

39. A method for exhibiting both of excellent ride comfort during driving under a condition of a normal internal pressure and excellent durability under a run flat state of a pneumatic tire which comprises a carcass layer, a tread portion disposed at an outside of the carcass layer in a radial direction of the tire and a pair of side wall portions disposed at right and left sides of the tread portion, the method comprising disposing a rubber member constituted with the rubber composition described in any one of Claims 1 to 37 on the side wall portions

40. A method for exhibiting both of excellent ride comfort during driving under a condition of a normal internal pressure and excellent durability under a run flat state of a pneumatic tire according to Claim 39, the method comprising adjusting a minimum value or larger of a dynamic storage modulus of the rubber composition within a temperature range of 200 to 250°C to a same value as a dynamic storage modulus at 50°C.